

### **REMARKS**

Claims 1-18, 42-51 and 54-69 were pending in the application. Claims 1-55 have been canceled in this Amendment. Claim 56 is amended to correct a minor typographical error. Claim 65 is amended to correct an antecedent basis. Claims 56-69 remain.

In response to the Office Action of December 21, 2006, applicant provides the following remarks.

#### **Rejections under 35 U.S.C. § 112**

Claims 1-11 and 45-47 were rejected under 35 U.S.C. § 112, second paragraph or second and fourth paragraphs. These claims have been canceled, making the § 112 rejections moot.

#### **Rejection under 35 U.S.C. § 102**

Claims 1, 2, 6-8, 12-14, 16-18 and 42-48 were rejected under 35 U.S.C. § 102(b) as being anticipated by Kaltenbach (U.S. Patent No. 1,582,274). Claims 1-7 were rejected under 35 U.S.C. § 102(b) as being anticipated by SU 1,337,338. These claims have been canceled, making the § 102 rejections moot.

#### **Rejection under 35 U.S.C. § 103 – Claims 1, 3-18, 42-55**

Claims 1, 3-18, 42-55, were rejected under 35 U.S.C. § 103(a) as being unpatentable over various combinations of Kaltenbach, Goss et al. (U.S. Patent No. 4,061,230), SU 1,337,338, Wampach (U.S. Patent No. 2,966,752) and other cited prior art. These claims have been canceled, making the § 103 rejections moot.

#### **Rejection under 35 U.S.C. § 103 – Claims 56-61, 64, 67-69**

Claims 56-61, 64 and 67-69 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wampach in view of Kaltenbach. In the Office Action, it is asserted that Wampach shows a vertical post, a superstructure, a boom and a series of rollers, all as claimed in claim 56. However, the Office Action acknowledges that “Wampach varies from the claims as rollers (34) are not arranged as a roller chain.” Office Action of December 21, 2006, ¶17. The Office Action then asserts that Fig. 13 in Kaltenbach teaches a crane roller chain with rollers 26 in a pivotally linked sequence, with equal spacing and with at least 180 degrees between a first

roller and a second roller and first and second anchors for the roller chain linked to the superstructure. The Office Action further asserts that Kaltenbach teaches taking up slack due to roller wear and controls relative rocking motion between the superstructure and the tower. The Office Action finally asserts that: "It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the rollers (34) of Wampach by forming them as roller chain, as to have their mounting adjustable, as taught by Kaltenbach." Office Action of December 21, 2006, ¶17.

Wampach teaches a truck-mounted crane with a cylindrical hub 33, a swing bed 5 with a boom foot 9 for attachment of a boom 8, which can be raised and lowered in a vertical plane. Wampach further shows a series of rollers 34 that roll against hub 33. The rollers 34 are contained in rolling contact with the hub 33 by annular member 35 secured to a plate 36 by bolts or screws. Top and bottom guide plates 38 and 39 are secured to members 35 and 36 and extend inwardly therefrom to overlie the ends of rollers 34 and retain them in rolling contact with the hub 33. Wampach Figs. 2, 3, col. 4. lines 44-55. Thus, Wampach not only lacks any teaching of chaining a ring of rollers, but demonstrates the difficulty of access to rollers 34 for repair when the rollers are kept in a retaining structure that is fixed around them, i.e., annular members 35, 36. It would appear that no repair of rollers 34 is possible without removing the entire boom 8 and swing bed 5 and further removing the guide plates 38, 39.

It should further be noted that in Wampach rollers 34 carry little or no overturning forces. The placement of rollers 41 and 44 on either side of the plate 28, with both sets of rollers 41, 44 outside the circumference of rollers 34, means that rollers 41, 44 carry the primary vertical and overturning loads. Wampach's overturning forces are applied by rollers 41, 44 to the top and bottom of plate 28. Rollers 34 merely help center the rings containing them against outside induced horizontal loads (i.e., wind or other non-boom loads) and facilitate rotation on the hub 33. As will be seen, this design principle is contrary to Kaltenbach's and applicant's designs.

Kaltenbach shows linked rollers 26, in stacked pairs, which encircle and ride on rails 25 that are mounted on a circular girder 13<sup>b</sup>. Kaltenbach's crane boom 10 is not mounted for tilting at a boom foot. It is a fundamentally different form of crane boom from that in Wampach or in applicant's invention, being horizontal and overbalanced. Per Kaltenbach:

Referring to the drawings, 10 represents the load supporting part of the arm or boom of the crane which may be provided with any desired number of hoists 11 and 12. The arm is extended beyond the center of rotation where it is provided

with a counterbalancing portion 10<sup>a</sup> which preferably overbalances the weight of the main portion 10 of the arm when the latter is provided with no 100 load. The arm or boom is supported on a central stationary tapering tower 13 which is supported on a base or portal 14, and the arm is provided with a long depending skirt 15 which encircles the tower and transmits to the base thereof by a lateral thrust, the unbalanced load of the arm when the latter is with or without load.

Kaltenbach p. 1, lines 92-108 (emphasis added). Further, Kaltenbach is also a fundamentally different form of crane from that in Wampach or in applicant's invention, because Kaltenbach's load is not applied primarily at the boom foot as in Wampach or in applicant's invention, but rather at a top casting 18 that carries a heavy pivotal pin 17. Further per Kaltenbach:

It will be observed in passing, that the entire weight of the rotating structure, as well as the live load supported by it, is transmitted to the top of the tower . . .

Kaltenbach p. 2, lines 34-38.

It is respectfully submitted that the asserted combination of Wampach and Kaltenbach is not proper, in view of the fundamental differences in their crane structures and load bearing principles. First, while Kaltenbach describes its rollers 26 as for resisting lateral loads from the boom (Kaltenbach p. 2, lines 110-116), as noted above, Wampach's rollers 34 do not serve that function. Thus, a person skilled in the art would not be led to make a functional link between Kaltenbach's semi-circular roller sets and Wampach's ring-contained rollers 34, which have no significant overturning forces applied to them by a boom. Second, it is noted that one feature of applicant's invention and of Kaltenbach is location of the roller chain anchors on a rotating superstructure. The Office Action does not cite any teaching or suggestion of where Wampach would anchor an inserted roller chain, even assuming the substitution of a roller chain for ring-captured rollers 34 were suggested by the cited prior art combination. As will be seen, with a roller chain, anchors must be provided and located somewhere where they can be adjusted, but Wampach has no teaching of where anchors might be placed in its structure. In conclusion, it is submitted that although both Wampach and Kaltenbach are cranes, their differences are such that their combination in the manner asserted, i.e., converting Wampach's unlinked, ring-contained roller set, which does not carry significant overturning forces, into Kaltenbach's linked rollers that carry such forces is conceivable only in hindsight guided by applicant's teaching.

However, even assuming arguendo that the combination of Wampach and Kaltenbach were proper, that combination does not teach or make obvious applicant's invention. In particular, applicant's claim 56 claims:

the first and second anchors being positioned to make the arc of the roller chain substantially symmetrical with respect to the vertical plane of boom motion and to tension the rollers against the post-bearing surface, whereby the pivoting action of the rollers maintains substantially equal distribution of radial loads from the boom across all rollers in the roller chain.

The symmetry recited helps achieve applicant's objective of using the roller chain to resist and distribute over a linked roller arc of at least 180 degrees the large overturning force of applicant's boom, when loaded and positioned at a typical operating angle in the vertical plane in which it rotates around a boom foot.

Kaltenbach does not teach or suggest positioning roller anchors to obtain symmetry relative to the boom. Although no drawing in Kaltenbach directly shows the orientation of boom 10 relative to Kaltenbach's two semicircular roller chains, as seen in Fig. 2 of Kaltenbach, the skirt 15, is formed with four columns 15<sup>a</sup>, one at each corner of the skirt 15. According, referring also to Kaltenbach Fig. 1, which shows the boom 10 and counterbalancing portion 10<sup>a</sup>, the horizontal arm or boom 10 can only be positioned so that its longitudinal axis is perpendicular to a line extending between any two adjacent corner columns, 15<sup>a</sup>, 15<sup>a</sup>. Given that constraint, referring to Fig. 2, it can be seen that Kaltenbach's boom must be oriented at either just past a 9 o'clock-3 o'clock position or just past a 12 o'clock-6 o'clock position across the crane base in Fig. 2. (This can be seen by laying a pencil across Kaltenbach Fig. 2, using the top of the figure as 12 o'clock.) Fig. 2 shows the anchoring points for the two semicircular roller sets (levers 29 on pins 30; see also Kaltenbach Fig. 13) at approximately the 10 o'clock and 4 o'clock positions. As can be seen, in either possible boom position, neither of the arcs of rollers has its anchors positioned to "make the arc of the roller chain substantially symmetrical with respect to the vertical plane of boom motion" (assuming that Kaltenbach's boom had any vertical plane motion, which--aside from skirt tilting--it does not).

Applicant's positioning of its roller chain anchors is not arbitrary. It is part of the design for distributing large boom overturning loads back to the crane post bearing surface configured to carry them, where the roller chain can share the load equally across all rollers in the chain. Kaltenbach does not show or suggest this positioning. In fact, it specifically shows only the positioning visible in Fig. 2.

Kaltenbach's teachings are also of questionable relevance, because its boom 10 has no significant vertical plane motion. As a horizontal boom, Kaltenbach mentions "relative rocking motion between the skirt and the tower due to the unbalanced load." Kaltenbach p. 2, lines 107-109. In Kaltenbach the unloaded boom will be overbalanced and load that side of the skirt and roller chain beneath counterbalancing portion 10<sup>a</sup>; but a heavy enough load will overcome the counterbalancing portion 10<sup>a</sup> and load that side of the skirt and roller chain beneath boom 10 with hoists 11, 12. In applicant's crane, the boom has no significant counterbalance. Applicant's roller chain will always carry at least the lateral force from the boom itself. As applicant's boom is loaded, the forces absorbed by the roller chain increase, but they would not normally switch 180 degrees from one side of the post to the other as in Kaltenbach.

In sum, the cited combination of Wampach and Kaltenbach (1) is not motivated, because Wampach's rollers 34 do not carry the same overturning forces as Kaltenbach's roller chains; and (2) this combination does not show or suggest how a roller chain would be introduced and anchored in Wampach. The combination thus is improper. More importantly, even if the combination were proper, it would still not produce a roller chain configured relative to the boom as claimed by applicant. Reconsideration and withdrawal of the rejection of claim 56 are respectfully requested.

Claims 57-61, 64, and 67-69 depend directly or indirectly from claim 56; thus, these claims are patentable for at least the reasons described above with respect to claim 55.

#### **Rejections under 35 U.S.C. § 103 – Claim 62**

Claim 62 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Wampach in view of Kaltenbach, as applied to claim 56, and further in view of deJong. DeJong mentions use of v-shaped rollers. However, deJong does not show any roller chains or anchoring positions for roller chains. Thus, deJong does not cure the teaching deficiencies of Wampach or Wampach combined with Kaltenbach. Accordingly, even assuming arguendo that Wampach, Kaltenbach and deJong have a suggestion or teaching of their combination, as discussed above, the cited combination does not make obvious the combination with a roller chain configured as claimed in amended claim 56. Accordingly, still less would the combination make obvious claim 62, dependent on claim 56.

Reconsideration and withdrawal of the rejection of claim 62 based on Wampach, Kaltenbach and deJong are respectfully requested.

Claim 62 also was rejected under 35 U.S.C. § 103(a) as being unpatentable over Wampach in view of Kaltenbach, as applied above to claim 56, and further in view of Ehret. Ehret shows use of v-shaped rollers. However, Ehret does not show any roller chains or anchoring positions for roller chains. Thus, Ehret does not cure the teaching deficiencies of Wampach or Wampach combined with Kaltenbach. Accordingly, even assuming arguendo that Wampach, Kaltenbach and Ehret have a suggestion or teaching of their combination, as discussed above, the cited combination does not make obvious the combination with a roller chain configured as claimed in amended claim 56. Accordingly, still less would the combination make obvious claim 62, dependent on claim 56.

Reconsideration and withdrawal of the rejection of claim 62 based on Wampach, Kaltenbach and Ehret are respectfully requested.

**Rejection under 35 U.S.C. § 103 – Claim 63**

Claim 63 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Wampach in view of Kaltenbach, as applied above to claim 56, and further in view of Zaugg or Baker. The Office Action asserts that either Zaugg or Baker shows arcuate bearing surfaces. However, neither Zaugg nor Baker shows any roller chains or anchoring positions for roller chains. Thus, neither Zaugg nor Baker cures the teaching deficiencies of Wampach or Wampach combined with Kaltenbach. Accordingly, even assuming arguendo that Wampach, Kaltenbach and Zaugg or Baker have a suggestion or teaching of their combination, as discussed above, the cited combination does not make obvious the combination with a roller chain configured as claimed in amended claim 56. Accordingly, still less would the combination make obvious claim 63, dependent on claim 56.

Reconsideration and withdrawal of the rejection of claim 63 based on Wampach, Kaltenbach and Zaugg or Baker are respectfully requested.

**Rejection under 35 U.S.C. § 103 – Claim 64**

Claim 64 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Wampach in view of Kaltenbach, as applied to claim 56, and further in view of Goss et al. '230. The Office Action asserts that Goss et al. shows use of rollers on the front or boom side of the superstructure and idler rollers fixedly mounted on the back side of the superstructure. However, Goss et al. does not show any roller chains or anchoring positions for roller chains. Thus, Goss et al. does not cure the teaching deficiencies of Wampach or Wampach combined with Kaltenbach. Accordingly, even assuming arguendo that Wampach, Kaltenbach and Goss et al. have a suggestion or teaching of their combination, as discussed above, the cited combination does not make obvious the combination with a roller chain configured as claimed in amended claim 56. Accordingly, still less would the combination make obvious claim 64, dependent on claim 56.

Reconsideration and withdrawal of the rejection of claim 64 based on Wampach, Kaltenbach and Goss et al. are respectfully requested.

**Rejection under 35 U.S.C. § 103 – Claims 65-66**

Claims 65 and 66 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wampach in view of Kaltenbach, as applied to above to claim 56, and further in view of Burnett. The Office Action asserts that Burnett shows use of rollers with a containment pad or flange. However, Burnett does not show any roller chains or anchoring positions for roller chains. Thus, Burnett does not cure the teaching deficiencies of Wampach or Wampach combined with Kaltenbach. Accordingly, even assuming arguendo that Wampach, Kaltenbach and Burnett . have a suggestion or teaching of their combination, as discussed above, the cited combination does not make obvious the combination with a roller chain configured as claimed in amended claim 56. Accordingly, still less would the combination make obvious claim 64, dependent on claim 56.

Reconsideration and withdrawal of the rejection of claim 65-66 based on Wampach, Kaltenbach and Burnett are respectfully requested.

**CONCLUSION**

This application now stands in allowable form and reconsideration and allowance are respectfully requested.


The Commissioner is hereby authorized to charge any deficiencies or credit any overpayments to Deposit Account No. 04-1420.

If the Examiner should require any additional information or amendment, please contact the undersigned attorney.

Respectfully submitted,

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